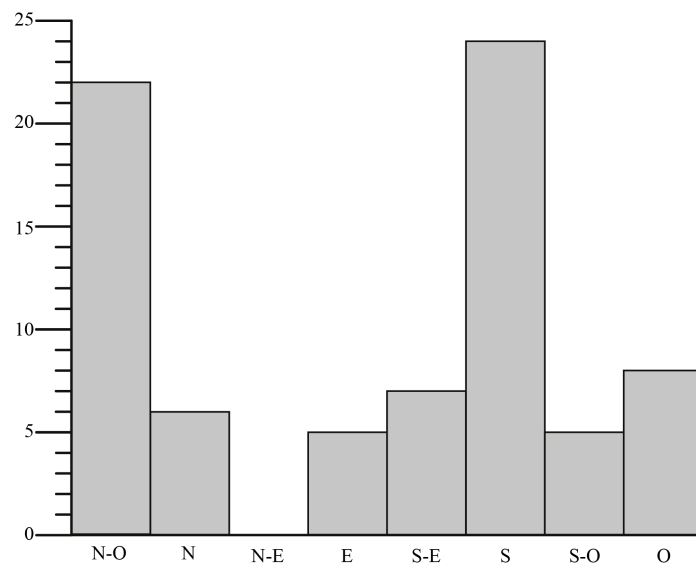# Supplements

Supplementary table 1: Descriptive statistics of quantitative morphological characteristics of avalanche paths.

Variable	Mean	Std. deviation	Range
Length (m)	1515	615	594-2860
Minimal elevation (m a.s.l)	1781	123	1461-2313
Maximal elevation (m a.s.l)	2731	397	2120-3731
Mean elevation (m a.s.l)	2281	260	1936-2942
Vertical drop (m)	950	395	331-1887
Area minimal slope (°)	3	4	0-15
Area maximalslope (°)	82	81	39-89
Area mean slope (°)	39	7	26-49
Surface area (ha)	36	39	3-172

Supplementary Table 2: Pearson correlation ρ between the morphological descriptors and orientations of the set of analyzed avalanche paths. Values in bold are significant at the 0.05 level.

	Min elevation	Mean elevation	Min slope	Max slope	Mean slope	Surface area	N-W	N	N-E	E	S-E	S	S-W	W
Min elevation	1	**0.26**	-0.09	0.10	0.14	-0.09	**0.25**	-0.04		-0.03	0.01	-0.19	-0.01	-0.03
Mean elevation	**0.26**	1	**-0.42**	**0.38**	0.06	**0.74**	-0.04	0.03		-0.01	0.02	0.14	-0.08	-0.12
Min slope	-0.09	**-0.42**	1	**-0.48**	0.07	**-0.41**	0.08	0.17		-0.19	-0.22	0.16	-0.01	-0.14
Max slope	0.01	**0.38**	**-0.48**	1	**0.49**	**0.28**	0.06	-0.08		0.21	-0.16	-0.18	0.03	0.21
Mean slope	0.14	0.06	0.07	**0.49**	1	-0.19	**0.26**	-0.03		-0.15	-0.22	-0.12	-0.03	0.18
Surface area	-0.01	**0.74**	**-0.41**	**0.28**	-0.19	1	-0.22	0.05		0.10	0.09	0.10	0.07	-0.11
N-W	**0.25**	-0.04	0.08	0.06	**0.26**	-0.22	1	-0.18		-0.17	-0.20	**-0.43**	-0.17	-0.21
N	-0.04	0.03	0.17	-0.07	-0.03	0.05	-0.18	1		-0.07	-0.09	-0.20	-0.08	-0.10
N-E														
E	-0.03	-0.01	-0.19	0.21	-0.15	0.10	-0.17	-0.08		1	-0.08	-0.18	-0.07	-0.10
S-E	0.01	0.02	-0.22	-0.16	-0.21	0.09	-0.20	-0.09		-0.08	1	-0.21	-0.08	-0.11
S	-0.19	0.14	0.16	-0.18	-0.12	0.10	**-0.43**	-0.20		-0.18	-0.21	1	-0.18	**-0.23**
S-W	-0.01	-0.07	-0.01	0.03	-0.03	0.07	-0.17	-0.07		-0.07	-0.08	-0.18	1	-0.10
W	-0.03	-0.12	-0.14	0.21	0.18	-0.11	-0.21	-0.10		-0.10	-0.11	**-0.23**	-0.10	1

Supplementary figure 1: Number of paths by orientation

Supplementary Table 3: R^2 **statistics for the fitted neural network models. For each series (annual, winter and spring) and model type (3 or 8 layers) the table provides the median (50%), 80% and 97.5% percentiles over the distribution of the 100 bootstrap iterations.**

	3 layers			8 layers		
	50%	80%	97,5%	50%	80%	97,5%
Annual	0.18	0.32	0.46	0.28	0.43	0.57
Winter	0.29	0.45	0.57	0.33	0.56	0.76
Spring	0.06	0.21	0.37	0.10	0.30	0.54
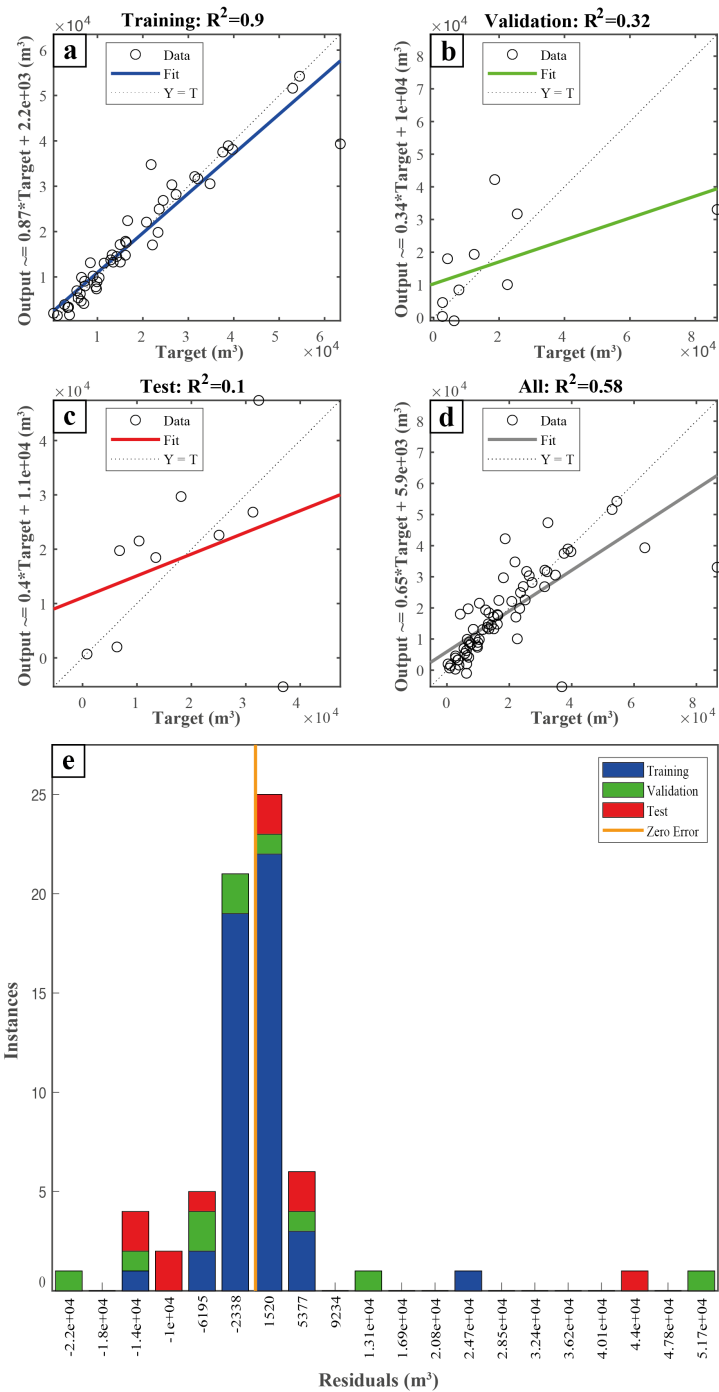
Supplementary Figure 2: Example of one (among the 100 bootrap iterations) fitted 8-layer neural network annual model. Linear correlation between observed and predicted values for: (a) training sample, (b) validation sample, (c) test sample, (d) full sample, (e) histogram of residuals for the training, validation and test samples.